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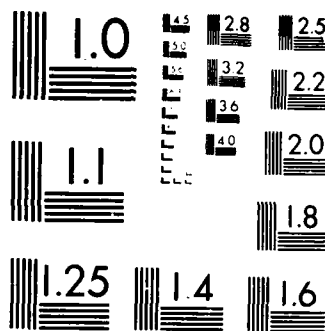
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Military Retirement and Social Security: A Comparative Analysis

by

Donald J. Cymrot

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Naval Planning, Manpower, and Logistics Division

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TOWARDS JUSTIFYING ENLISTMENT STANDARDS:
LINKING INPUT CHARACTERISTICS TO JOB PERFORMANCE

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Paper to be presented at 1986 American Psychological Association
symposium entitled "Setting Standards in Performance Measurement."

Military Retirement and Social Security: A Comparative Analysis¹

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1 Introduction

The Old Age and Survivor's Insurance (OASI) programs of Social Security and the military retirement system are two of the largest and fastest growing income replacement programs in the United States. Between 1950 and 1983 the number of OASI recipients increased from 3.5 million to 32 million [1], and military retirement recipients from 59 thousand to 1.1 million [2]. During the same period OASI benefit payments increased from \$961. million to nearly \$150. billion, and military retirement benefits from \$230. million to \$15. billion [2]. Together these expenditures represent over 20 percent of the federal budget in 1983.

The size of these programs, in terms of both coverage and cost, make them of continuing interest to policymakers. These programs are well provided for during period of fiscal expansions because they have politically active constituents. From the 1950's through the middle 1970's changes were made in both programs that made them more generous. In recent years, during a period of budgetary retrenchment, they still attract attention but for different reasons. Changes in these programs could save billions of dollars and have a significant impact on the budget deficit.²

In some ways these two programs are quite similar. Both are insurance-like programs that provide an annuity. In each, the size of the annuity depends on previous earnings, and collection of the annuity requires retire-

¹This paper originally appeared under the same title as Center for Naval Analysis Research Memorandum 85-102. It has been cleared for public release in this amended form by the Department of the Navy.

²Although Social Security is exempt from the automatic cuts of the Gramm-Rudman-Hollings balanced budget law, there is nothing in that law to prevent a cut in Social Security before automatic cuts go into effect.

ment from the system. OASI retirement requires a near complete withdrawal from the labor force. Military retirement occurs upon discharge from military service.³ But it does not necessarily result in a withdrawal from the labor force. Both OASI and military retirement provide income to replace earnings at a time when the value of a worker's employment declines. While military retirement typically takes place at a younger age than OASI, the reasons for the decline are the same. It results from reduced productivity due to aging, the desire to spend increased leisure time after years of perhaps arduous work or the need to make room for advancement of younger workers.⁴ Of course, military retirees may continue to work outside the military even though their value to the military has declined. A 1977 study showed that three fourths of military retirees seek work after retirement, and that three fourths of the job seekers are employed within a year.³

It is not surprising that similar programs are treated similarly by policy makers. But, are OASI and military retirement really similar programs? The answer is not really. The similarities are mostly superficial, while their differences are more substantive. They exist for different reasons and operate in different environments. OASI is a social insurance programs designed to promote the social welfare by redistributing income between generations (from young to old) and between income groups (from high to low). An OASI pension is not part of an employment contract with a particular firm, but is part of a social contract whereby in return for working at younger ages people are guaranteed a minimum standard of living in old age. Military retired pay is tied to service with a particular firm, the armed services. Their function is to improve the efficiency of the services by

³Discharge from military service does not necessarily imply a complete severing of ties. A retiree remains subject to recall and the the Uniform Code of Military Justice as long as he receives retired pay.

⁴Determinants of the value of employment change over time. The average person today is healthier than his counterpart 30 or 40 years ago. Productivity does not decline as rapidly with age. In the future, expected declines in cohort sizes will reduce the need to provide for advancement and shift the emphasis toward retention of people. While these changes do not eliminate the need for old-age income, they change the desirability of a particular parameter such such as a 65 normal retirement age. A well designed system needs to account for changes in circumstances.

influencing the decisions of military personnel about re-enlistment and retirement. This function is called force management, to control the number of military personnel and their distribution by experience. Long-term force planning implied by the retirement system is particularly important in the military because of the closed nature of military service. Unlike the OASI system (or even individual private employers) where workers can move in and out of the system, entry into military service (in non-emergency situations) takes place only at the lowest level.⁵ If there is a sudden increase in turnover at a middle level rank, the services must either bring replacements through the ranks or induce veterans to re-enlist. The absence of a ready pool of experienced replacements makes attrition particularly costly. The retirement system is one tool to control cost and force structure.

The provisions of OASI are age oriented in that retirement takes place at a particular age and in that the segment of the population singled out for benefits is defined by age. The OASI system is structured to meet both insurance and welfare goals. That is, to provide income for retirees based on their contributions to the system, and to redistribute income. But, since these goals are not always congruent, some provisions of OASI result from the attempt to compromise the insurance and welfare missions.

The military retirement system, as a force management tool, needs to be structured differently. Its provisions are service oriented in that benefits depend on years of service regardless of age. Years of service can be considered a proxy for productivity and return on the military's substantial investment of time and money in its personnel. A properly structured military retirement system will be set up to maximize that productivity and return.

The purpose of this essay is to establish the nature of the relationship between the mission and the structure of each plan. Understanding this relationship is useful for policymakers. Changes in a program, for budgetary or other reasons, should be made with an awareness of the impact on the system's ability to accomplish its mission. Given the fundamental differences between the rationales for OASI and the military retirement system,

⁵There are enlistment programs that bring in experienced workers at ranks above E-1, but these programs are small. For example in fiscal year 1985 the Navy's Direct Procurement Enlistment Program accounted for less than .1 percent of non-prior service recruits.

changes that appear the same may yield very different results.

2 Benefit Determination

On a superficial level, at least, both OASI and the military retirement serve as income insurance programs. They provide income to retirees. With this similarity it is not surprising that their benefit determination methods share certain characteristics. In both systems benefits are related to the retiree's earnings history, and in both annual cash benefits increase for each year that retirement is delayed. Neither system has a means test: qualified retirees receive benefit payments regardless of other sources of income or wealth. Both systems have survivors provisions, although with military retirement coverage is optional and reduces current benefits. Each has a Cost of Living Adjustment (COLA) provision which increase the nominal level of benefits at the rate of increase in the Consumer Price Index. Both plans are supplemented with disability and medical insurance programs. In each, the replacement rate (i.e., the percentage of pre-retirement earnings replaced by retirement benefits) is inversely related to the level of pre-retirement earnings.⁶

But just as there are similarities between the systems, there are also marked differences. In this section, the benefit structures of each is analyzed, and how these similarities and differences are related to the basic rationale of each is demonstrated.

2.1 Military Retirement Benefits

Military retirement benefits are first set at the time of retirement, and are then adjusted periodically for inflation. The initial retirement benefit (RB) is determined by a formulae with three elements, a multiplier, years of service (YS) and final base pay (FBP). The multiplier is currently fixed at .025, and the formula is

$$RB = .025 * YS * FBP \quad (1)$$

⁶The inverse relationship for the military retirement system is an indirect consequence of the structure of the system. A more detailed discussion is provided below.

Since military personnel generally may only be retired with from 20 to 30 years of service, retirement benefits range from between 50 percent and 75 percent of final base pay.⁷ For current retirees FBP is basic pay in the last month before retirement, but for those who entered the service after 8 September, 1980⁸ FBP will be calculated as the average of the final 36 months of service.⁹

Basic pay is set by military pay tables with variables, rank and years of military service. All personnel of the same rank and years of service receive the same basic pay regardless of their military occupation or circumstances. But the basic pay used in the formula is not total compensation. There are also allowances, and incentives and bonuses. Allowances are payments made in lieu of services provided by the armed forces. For example, personnel living off military cases receive housing and subsistence allowances. Bonuses or incentives are payments for particular skills or as compensation for arduous duty. The greatest incentives are used to encourage re-enlistment in certain military occupations for which personnel are expensive to replace. For example, a qualified nuclear power officer can receive up to \$9000. per year for a four year re-enlistment [5]. If correctly set, these incentives can actually lower personnel costs because the re-enlistment bonus may be less than the cost of training a replacement. Payments are also paid for duties ranging from working in a hostile fire zone to working with persons afflicted with leprosy [4].

⁷Basic pay is only one element of the military pay and allowance compensation structure, and represents about 74 percent of a salary equivalent. As a function of basic pay only, military retired pay is about 37 percent of preretirement earnings at 20 years, rising to 54 percent at 30 years.

⁸This is the date that the law changing the formula passed Congress. All members of the military services at the time the law passed were grandfathered into the old, more lucrative system. Grandfather clauses are analyzed in more detail in the next to last section.

⁹Under the recently enacted military retired pay reform law, the formula is modified further for personnel entering the armed forces after 1 August 1986. The new law has a two tier system. For retirees under age 62 the multiplier is 2 percent a year for the first 20 years and 3.5 percent per year for years 21 through 30. In this case retired pay ranges from 40 percent to 75 percent of basic pay. Once the retiree reaches age 62, retired pay is recalculated using the current formula of 2.5 percent per year of service.

Using basic pay rather than total compensation to compute retirement benefits has a number of consequences. First, it provides more flexibility in adjusting the timing of pay. General compensation can be raised without increasing retirement costs. For example, in 1976-1977 a portion of the overall military pay raise was allocated to the Basic Allowance for Quarters. Since the allowance is not included in basic pay, retirement costs increased at a slower rate than current pay [4]. Second, it provides more flexibility in adjusting pay in an occupation over time. With this system, current compensation can be adjusted without affecting future pay. If the Navy or Air Force has a temporary shortage of fighter pilots, higher re-enlistment bonuses can be paid to meet this specific need without increasing retirement costs for the next 30 years. Third, it allows for differential retirement incentives across ratings or military occupations. Those occupations that typically receive high re-enlistment incentives or bonus pay have a lower replacement rate than other military occupations. With a lower replacement rate there is less incentive to retire because retirement causes a larger relative drop in income. If, as would be expected, incentives and bonuses are paid in those occupations that are the most costly to replace and hardest to fill, then this method of calculating retirement benefits efficiently promotes retention.

The benefit formula makes no adjustment for differences in life expectancy at the time of retirement. For each additional year of service, regardless of age, benefits are increased by 2.5 percent. The difference in life expectancy between a 40 and 44-year-old retired officer is only slightly less than the 4 year difference in age. On average a 40 year old will collect benefits for about 3.7 years longer than a 44 year old (38.1 vs. 34.4) [5]. The difference for enlisted personnel is even larger (34.8 vs. 31.2). While this difference might seem significant, it is not nearly as large as it would be if retirement took place at the age of OASI retirement. For a \$20,000 annual pension discounted at a 10 percent interest rate, the value of the extra 3.7 years is only about \$2500. If the same comparison is made between a 62 and 66 year old officer, additional life expectancy is only 3 years (15.9 vs. 18.9) [5], but the difference in discounted present value is about \$10,500., or over 4 times the difference at the younger age. Thus, the absence of a benefit adjustment for age is of relatively little consequence in the military

retirement system. If there are two officers of the same rank and years of service but of different ages, the younger one does not have a much stronger incentive to retire than the older one.

The benefit formula defines the initial benefit at the time of retirement. Adjustments are made to the initial benefit to account for inflation.¹⁰ The current cost of living adjustment (COLA) provision increases benefits once a year at the rate of change in the Consumer Price Index. The COLA provision is among the most frequently changed in the military retirement system. Until 1958 retirement benefit increases were set equal to the rate of change in the base pay table for the rank and years of service at the time of retirement. In 1958 this practice was discontinued, and benefits were increased by 6 percent. No further changes were made until 1963 when a COLA formula was adopted that allowed for periodic adjustments in benefits tied to changes in the Consumer Price Index. Several changes were made in the formula during the 1960's and 1970's so that adjustments were made only once a year and only in the case when the Consumer Price Index increased by more than 3 percent. The rationale for the 3 percent rule is not entirely clear. Its effect would be to erode benefits slowly in periods of modest inflation, but to maintain the real value of benefits in the case of moderate or high inflation. In the 1980's several changes were made that effectively reduced the COLA protection, generally in the form of delays in COLA adjustments to benefits. In 1983 there was an explicit reduction in the COLA formula for retirees less than 62 year old, which reduced the adjustment by .6 of a percentage point below that of older retirees.¹¹

The COLA provision insures retirees against inflation. It shifts the risk

¹⁰Retired pay is adjusted at the same time and by the same percent as adjustments in civil service retirement annuities.

¹¹This change, while relatively small in of itself, is of some importance because under the newly enacted military retired pay law (effective for personnel entering on or after 1 August 1986), this type of distinction has been made a regular part of the system. For those under age 62, the COLA is 1 percent less than the inflation rate. At age 62 there is a one time adjustment in benefits to account for the erosion of inflation due to the incomplete COLA, and then the COLA is increased to be equal to the inflation rate. A more detailed analysis of the 1983 change is presented below.

of inflation onto the government which is better able to bear the cost.¹² By raising the present value of retired pay for active personnel, it helps reduce attrition.

The military retirement system also includes a survivor's insurance-like provision. The survivor's benefit program is a premium-based program that began in 1972, replacing an earlier one that had been entirely self-financed. Under this new program, the cost is split between retirees and the government. The retirees portion comes in the form of reduced retired pay. The maximum coverage for the spouse is for 55 percent of the basic retirement benefit. The cost to the retirees is 2.5 percent of the first \$300 in monthly coverage plus 10 percent of the difference between actual coverage and \$300. For a retiree with a monthly benefit of \$500 the total cost would be \$27.50 (2.5 percent of \$300 plus 10 percent of \$200). Additional benefits and costs are available for dependents where the costs are made on an actuarial basis. Unlike the basic retirement program, the survivors portion of benefits is integrated in to Social Security. This means that benefits for survivors are reduced one eligibility for survivor's payments under OASI are received, but are based only on the OASI benefit attributable to military service.¹³

Survivor's benefits serve a similar function to that of the COLA.¹⁴ By raising the present value of military compensation, these benefits reduce attrition. However, this survivors benefits provisions has distributional

¹²Until recently inflation insurance was not available in the private insurance markets, and so the government was the only source of such insurance. A market for inflation index options has not been established. These options can be used to hedge against inflation, and they provide the first alternative to COLA protection. However, participation in this market requires a degree of financial sophistication not possessed by the average person. COLA's remain the best inflation protection for the average person.

¹³In the 1985 Department of Defense Authorization Bill (PL 99-145) the Social Security offset system was eliminated, and the benefit formula was changed. For survivors under age 62 the survivor's benefit is 55 percent of basic pay, and for survivors age 62 or above the benefit is 35 percent of basic pay. The reduction in the percent for older survivors is made in lieu of the offset.

¹⁴Unlike inflation insurance, survivor's insurance is readily available in the private insurance market. The provision is efficient if the government can provide this insurance at a lower cost than private insurers.

effects. Costs are not allocated on an actuarial basis because everyone regardless of age, sex or rank¹⁵ pays the same premium. The government's share of the cost is different for different groups. This provision is consistent with force management if those receiving the greatest subsidy have the greatest value to the services.¹⁶

2.2 OASI Benefits

As with military retirement benefits, OASI benefits are first set at the time of retirement, and then adjusted over time to account for inflation. The method used for computing initial benefits is more complex. It has three stages: calculation of average lifetime earnings, determination of the basic insurance coverage, and adjustments for family size, age of retirement and other factors [6]. The way of calculating average earnings and the formula used to determine basic coverage was change for individual's retiring after 1978. While the details have changed, the essential characteristics, more generous toward low earnings histories and families, have remained the same. The discussion is limited to the method used for current retirees.

OASI benefits depend on the individual's earning history, as measured by the Average Indexed Monthly Earnings (AIME). Covered earnings (i.e., subject to the payroll tax) are used to calculate an average monthly earnings from the time the worker turned 21, or from 1951, whichever is later, until he retires. The lowest five years of earnings are not considered in the average; earnings through age 60 are subject to an indexing procedure. Excluding the lowest earnings and indexing other earnings tends to reduce the amount of variation in average earnings both within and across cohorts. The procedure for ascertaining the AIME is fairly complicated. Each year's earnings are adjusted individually for each cohort. An index number is calculated by dividing the national average for covered earnings for the year the cohort turns 60 by the national average for covered earnings for the particular year being indexed. For example, suppose a cohort turns 60

¹⁵Rank is significant because the life expectancy of retired officers is greater than that of enlisted personnel. See [5].

¹⁶It is beyond the scope of this paper to disentangle all the factors that determine which group gets the largest subsidy. However, it is an important research question.

in year A when the national average of covered earnings is \$15,000, and in some earlier year B the national average of covered earning was \$3000. The index number for this cohort for year B is 5 (\$15,000/\$3000). The actual covered earnings for each member of that cohort is multiplied by 5 to determine the indexed earnings. This procedure is repeated for each year up to the year when the cohort turns 60. An individual's AIME is the simple average of monthly earning, which includes indexed earnings through age 60 and unindexed earnings from age 61 through retirement.

Next, AIME is used to determine the level of basic coverage, which is called the Primary Insurance Amount (PIA). Calculating the PIA from the AIME is like calculating the income tax from the adjusted gross income. There is a formula with different brackets; each bracket having a different benefit rate. Since 1978 there have been three brackets. The borders between brackets, called bend points, are adjusted annually using the same indexing formula used for averaging earnings. In 1984 the PIA formula was 80 percent of the first \$254; plus 32 percent of the amount between \$254 and \$1538; plus 15 percent of the amount over \$1538. While the PIA increases with average earning, the ratio of the PIA to the AIME is inversely related to average earnings. This formula is *progressive*, rewarding low earners more generously than high earners. The table below illustrates this feature.

The Progressivity of
OASI Basic Coverage

AIME	PIA	PIA/AIME
\$250	\$200	.80
500	282	.56
1000	442	.41
2000	638	.34

The progressivity of the formula is further enhanced by a minimum PIA provision. This provision guarantees a minimum PIA for retirees with histories of low earnings. Setting a floor on benefits is one of the clearest examples of the income redistributive function of OASI. The minimum PIA provision was repealed in 1982, but shortly thereafter a new special

minimum PIA provision was enacted, one that is more restrictive. Under the old system there was one minimum PIA for all. Under the new provision the size of the minimum PIA depends on the number of years of covered employment. The new provision lowers or eliminates the minimum PIA for someone who spent most of his working years in non-covered employment (e.g., government employees), but who qualifies for OASI from part-time or second career work. The purpose of the new restrictions is to limit the benefits from this redistributive feature to the working poor.

PIA sets the initial coverage under OASI, but for most recipients the PIA is not the actual benefit. Family circumstances, age at retirement, earnings, and past and current inflation rates all influence the size of the benefit. The PIA equals the benefit for a single person either never married or a widow or widower, with no dependents, retiring at age 65, with no current earnings, in the first year of retirement. Otherwise, the benefit is different from the PIA.

For married couples or single persons with dependent there is a family benefit. The spouse of a qualified retiree is entitled to an additional benefit equal to 50 percent of the PIA. The total benefit for a couple (with only one earnings history) is 150 percent of the PIA. If both the husband and wife qualify for benefits, then the couple must choose between accepting the benefits or accepting the two separate pensions. Another family benefit adjustment is made for dependents under age 16, or in some circumstances, under 18 and in school. The benefit for each qualified dependent is also 50 percent of the PIA. All the family benefit are subject to a maximum benefit provision. The benefit limit varies with the level of the PIA, but not with the number of dependents. This provision illustrates the tension between the welfare and insurance roles of OASI. As welfare, the system should not provide too much to any one family. As insurance, additional contributions to the system deserve additional rewards. The maximum benefit provision is a compromise between these two roles.

Retirement age also influences the size of benefits. Normal retirement occurs at age 65, early retirement between 62 and 65, and delayed retirement between 65 and 72. The benefit equals the PIA at normal retirement. If the worker retires before age 65, benefits are reduced by 5/9 of 1 percent per month. Retirement at 62 leaves a benefit of 80 percent of the PIA. The

reduction in benefits is justified on an actuarial basis. A person retiring at 62 has a longer tends to equalize the expected lifetime benefit. If retirement is delayed until after age 65, then the benefit increases by 3 percent per year until retirement or until age 72. After age 72 benefits can be collected whether or not the person actually retires. Until 1982, the delayed retirement credit was only 1 percent. The rise to 3 percent does increase the incentive to remain in the labor force, but it is still a relatively weak. The penalty for early retirement, 6.67 percent per year, is larger than the 3 percent gain for delayed retirement. Additional employment after age 65 reduces expected lifetime benefits, which encourages retirement at age 65. The retirement age provisions were changed in the 1983 amendments to the Social Security Act. By the year 2023 the normal retirement age will be 67, and the retirement income credit 8 percent per year. Both of these changes are designed to reduce expected lifetime OASI benefits. With the growth of private pensions and other forms of retirement saving, the need for a large social insurance program has been lessened. In addition, the payroll tax has become increasingly burdensome on the young. The reduction in future benefits is a way of forestalling unpopular payroll tax increases.

The size of current benefits also depends on the size of current earnings. Under OASI an individual can be employed and still be considered retired. Eligibility for current benefits is set by the earnings test. Retirement as defined by the test means having earnings (as opposed to income) under the exempt level. The exempt level changes annually and differs by age. In 1984 the exempt level for \$6960 for those age 65 and older, and \$5160 for those under 65. For earnings in excess for these levels, benefits are subject to a 50 percent reduction rate. For example, if a 65 year-old with a normal benefit of \$6000, earns \$10,000, excess earnings are \$3040 (\$10,000-\$6960). The benefit reduction would be \$1520 ($.5 \times \3040), and his actual benefit \$4480 (\$6000-\$1520). In this situation a worker could earn up to \$20,960 and still receive some benefits. The amount of the benefit reduction is recalculated each year as the current earnings, normal benefit and the exempt level change. The earnings test is a unique feature of OASI. OASI operates in an open system, with coverage spread throughout the entire economy. Other pensions, including the military, cover an individual employer or closely knit group of employers. A person retires from the military when he is no

longer in the military; there is a much clearer point of retirement. With OASI, however, a person could retire from his main career job and still be employed, perhaps part time, within the system. The function of the earnings test is to smooth over the sharp distinction usually made between working and retirement.

Like military retirement, OASI is protected from inflation by a cost of living adjustment provision. The current benefit reflects both the past earnings history and past inflation. A formal cost of living adjustment was implemented in 1975; before that, benefits were increased from time to time through legislation. The initial COLA indexing formula mistakenly increased future benefits at a faster rate than inflation, and so it was changed in 1978. The cost of living adjustment is currently made once a year in December when the increase in the Consumer Price Index is greater than 3 percent during the previous year.

The survivor's benefits under OASI are an automatic part of the program. There is no additional cost as is the case under the military retirement program. Survivor's benefits for a spouse are equal to 100 percent of the PIA. This amount is 67 percent of the actual family benefit. For other dependents, the survivor benefit is 75 percent of the PIA or 50 percent of the family benefit.

Both the COLA and survivors benefits serve the social welfare function of OASI.¹⁷ the COLA guarantees that the purchasing power of the initial benefit is maintained even in the face of inflation. The survivors benefits ensure that the needs of surviving spouses are met.

¹⁷An alternative interpretation of these provisions is that they are forms of insurance. The COLA insures against the risk of reduced purchasing power from inflation, and survivors benefits, which is a form of life insurance, insures against the loss of income due to the death of a wage earning spouse. Recipients pay implicit insurance premiums by accepting lower benefits. In other words, in the absence of these provisions, benefits would rise. I am grateful to Dean Leamer for suggesting this interpretation. However, I think the evidence indicates that benefits levels are not closely tied to the existence of these provisions. For example, the 1982 Social Security reform law reduced the COLA, but did not correspondingly increase benefits.

2.3 Some Comparisons of Benefit Provisions

Sometimes similar provisions exist in both military retirement and OASI. Policymakers err, however, when they make simple comparisons of such provisions between plans without considering their function in each plan. If the rationale for a particular provision (e.g., a COLA) is different in the different systems, the provision should be evaluated by determining its effectiveness in achieving its goal for its system.

The lifetime present value of military retirement benefits is considerably greater than OASI benefits. The dominant reason for the relative generosity is that, on average, military retired pay is paid at a younger age and for a longer period than OASI. At age 42, the present value of OASI benefits that will not start for at least 20 years is quite small after discounting even at a modest discount rate. For example, the present value of \$20,000 to be paid in 20 years when the discount rate is 10 percent is only \$2973. Even the undiscounted budgetary costs for OASI is much smaller, because the average military retiree receives his retired pay for 20 years longer. There is no reasonable level at which benefits could be set to equalize their present values. The comparison between the lifetime present values of military retirement and OASI, although often made, is beside the point. The two programs have different benefit levels because they have different purposes.

The reasonableness of the cost of each program should be measured against the benefits it produces. The military retirement program is meant to help retain personnel. Reductions in retirement costs would lead to increases in other costs. With smaller retired pay, turnover among mid-career personnel would be likely to increase. Higher turnover means higher costs for hiring and training replacements. The efficiency of an across-the-board cut in military retired pay should be weighed against the increase in turnover costs and the effect of less experienced personnel on military readiness. OASI, on the other hand, is meant to redistribute income to the elderly, in general, and especially the elderly poor. Policymakers need to decide whether the value to the social welfare of the benefits to these groups (the poor and the elderly) is equal to the value of other programs. In addition, they must decide whether the value of OASI benefits to the poor is equal to the value to the non-poor. Across-the-board cuts have the advantage of treating everyone equally, but a dollar cut from a low-income

recipient may have a greater impact than a dollar cut from a high-income recipient. An alternative to across-the-board cuts is a selective cut, such as taxing benefits of high income recipients¹⁸ or decreasing the percentages in the upper brackets of the primary insurance amount formula. Selective cuts minimize the injury to the poor, but such cuts weaken the insurance structure of the system and reduce the incentive for non-OASI retirement saving. Thus the tradeoffs in the two programs are quite different. It would be surprising if the optimal policy were to make identical changes in both programs.

Across-the-board cuts have not been implemented in either system in recent years. Rather, the more common way to adjust the value of benefits has been to make changes in the cost of living adjustment formulae. In 1983 the OASI COLA was delayed from June until December; in the same year the COLA for military retirees under age 62 was set lower than the inflation rate. In both cases, the cut on the cost of living adjustment reduces the value of benefits. The effect of a reduction in the cost of living adjustment is similar to that of an across-the-board cut in benefits. In OASI, policymakers still face the tradeoff between the social welfare considerations of the burden on the poor, and the social insurance consideration of maintaining a relationship between taxes paid and benefits received. The 1983 OASI delay was a one-time reduction in benefits. Only current recipients were affected. An additional consideration for one-time cuts is intercohort equity. In a social welfare program, everyone should be treated as equally as possible regardless of birth cohort. One-time changes in programs do not treat people equally across cohorts.

In the case of military retirement, the analysis is different. A cut in the cost of living adjustment has no impact on the retirement decisions (or attrition costs) of current retirees, but it may have an impact on the retirement decisions of active personnel. A one-time reduction in the adjustment, such as a six-month delay in applying the adjustment, has no impact on the benefits of future retirees, and so it does not have an effect on retirement or attrition costs. But, one cut may be perceived as foreshadowing future cuts. In this case, turnover could increase because

¹⁸The taxing of half of OASI benefits for recipients with income in excess of \$25,000 for single individuals and \$32,000 for married couples was started in 1984.

the present value of expected future benefits is reduced.

Such cuts may still be a relatively efficient way of reducing the cost of retired pay because of discounting. If the government's discount rate is smaller than the individual's discount rate,¹⁹ then the value of a marginal change in the inflation protection to the individual is smaller than the cost of that change to the government (i.e., military). In general, reducing deferred compensation such as the cost of living adjustment, and increasing current compensation, lowers the cost of a given retention rate.

Not all cost of living adjustment changes are either one-time or across-the-board. In 1983 the adjustment for retirees under age 62 was set at .6 percentage points below the inflation rate, while the adjustment for retirees age 62 and older was left intact. Whether this change worked optimally as force management while reducing retired pay costs to the government is doubtful. Since a 30 year-old deciding whether to continue his military career places a higher value on benefits he will receive shortly after retirement, in 10-15 years, than those he will receive at age 62 in 32 years, maintaining the inflation protection for older retirees has a smaller impact on retention than a smaller reduction for all retirees.²⁰ In this case the across-the-board reduction would have been more efficient.

The benefit provisions also have an effect on the timing of retirement. Nearly 2 of 3 men and over 3 of 4 women accepted early retirement benefits under OASI, and about 1 of 3 officers and 1 of 2 enlisted men retired at 20 years in 1976 [8]. The timing of retirement is significant because it affects both the cost of the program, and in the case of military retirement also the number of experienced personnel that remain in the military. Although on the surface the provisions that influence the timing of retirement are quite different, these difference are more superficial than real. OASI has a number of provisions such as normal retirement age, early retirement and delayed retirement credits that are not part of the military retirement

¹⁹Cylke, et. al. [7] have estimated the personal discount rate for military personnel at 17 percent. It is reasonable to assume that the government evaluated programs using a smaller discount rate

²⁰This analysis is also applicable to the newly enacted military retired pay reform law. The new law not only applies a lower COLA formula to retirees under age 62, but also uses a less generous formula to calculate retired pay.

system. But, in both cases the delay of retirement for one year the multiplier used to calculate benefits increases. Three factors that influence the timing of retirement are the effective basic pay, the change in the multiplier and life expectancy. The effective basic pay used to calculate benefits is more sensitive to an additional year of service in the military than in OASI. The basic pay used in calculating the military retired pay is final basic pay.²¹ The entire amount of any increase in earnings in the last year of work is captured in the military retired pay. In OASI the basic pay is the Average Indexed Monthly Earnings, which depends on many years of earnings history. An increase in earnings in one year has a relatively small effect on basic pay. Other things equal the basic pay change is stronger in deferring retirement in the military system than in OASI. The multiplier in the military system is fixed at 2.5 percent per year for each year from 20 to 30 years of service. In OASI the multiplier is 6.67 percent for ages 62 to 65 (a reduction in the early retirement reduction), and 3 percent for ages 65 to 72 (the retirement income credit). Other things equal, a higher multiplier means a stronger incentive to remain in the labor force. Each year that retirement is delayed shortens the individual expects to collect benefits. The decrease in life expectancy is .9 years per year for military personnel in their 40's. The decrease for civilians is about .7 years from age 62 to 65. Other things equal, the greater decrease in life expectancy for military personnel provides a stronger incentive to retire earlier. However, since life expectancy is much higher at the age of military retirement than at the age of OASI retirement, the present value of the difference is likely to be smaller for military retirement. The overall effect of the retirement incentive system appears greater for OASI than for military retirement. A larger proportion of eligible people defer retirement under the military system than under OASI. Of course, there are many other factors besides the factors mentioned here that influence the retirement system. Private pension plans and mandatory retirement schemes are two such factors. However, given the different purposes of OASI and military retirement it

²¹ Depending on the size of pay raises in the last few years of service, this effect might actually be stronger under the system where final basic pay is calculated from the last 3 years of service (for personnel entering after 8 September 1980) or from the last 5 years of service (for personnel entering after 1 August 1986.)

makes sense for the military scheme to have the weaker incentives to force retirement.

3 Other Benefit Related Provisions

3.1 Vesting

Pension benefits vest when the worker gains a non-forfeitable right to collect benefits upon retirement. In most retirement systems including both OASI and the military this right is not granted immediately upon entering the system. The individual must remain employed within the system for some minimum period of time to vest benefits. Two reasons for delaying vesting are to save on administrative costs of a plan and to retain workers. Setting up a retired pay account for an individual worker can be costly. If a worker only remains with a firm for a short period, the administrative cost may represent a substantial portion of the benefit. By delaying vesting the administrative costs are avoided until the worker accumulates a substantial benefit. Delaying vesting also imposes an increased cost of quitting on the worker. If he quits before vesting, he loses the right to collect benefits.

In the OASI system the employment requirement for vesting, fully insured status, is typically complex. The vesting rules are defined in quarters of coverage. To get credit for a quarter of coverage the worker has to have a minimum amount of earnings during the quarter. Before 1978 the minimum level was \$50. of covered earnings. Since 1978 the requirement has been adjusted each year according to changes in the Consumer Price Index. The minimum requirement in 1984 was \$390. The number of quarters required to qualify is on a sliding scale depending on the date of birth. The requirement is increasing. Most people still working today face a 40 quarter or 10 year requirement. The quarters need not be worked consecutively. A person can qualify for benefits by moving in and out of the system as long as he gets a total of 40.

Eligibility for retired pay simply requires 20 years of active service. Leaving before 20 years means that all retired pay rights are forfeited. Given the closed nature of the military system this cliff vesting (i.e., no partial vesting) provides a powerful incentive for experienced personnel to

remain in the military service for at least 20 years. Turnover rates among personnel with more than 10 years service are quite low throughout the military.

Critics of the 20 year vesting rule point to problems with the system. First, the harshness of the rule is deemed unfair. Only 13 percent of all military personnel ever collect a retired pay. Also, a 20 year cliff vesting rule is illegal in the private sector under the retired pay reform law of 1974 [9]. Second, incompetent personnel are sometimes kept for several years to enable them to qualify for the retired pay [10].

There are a number of responses to these criticisms. The qualification rate is low because the average age in the military is low. Even in the private sector where, by law, the vesting rules are more lax, less than 1/3 of those under 30 have vested benefits [11]. Even so, there are often times tradeoffs between equity and efficiency, and comparisons between military and civilian employment is tricky. The rationale for government regulation of private pensions is workers do not and can not get sufficient information to make informed judgements about their pension systems. The rules for military retirement have been stable, and changes tend to be made for future personnel and not present ones (i.e., there are grandfather clauses.) In addition, military retirement policy is determined in a public debate, but private retirement policies by private entities. Consequently military personnel have more information about their retirement system, both present and future, than the typical private worker. Without the need to redress information asymmetries there is no reason to require early vesting, and the 20 year cliff vesting rule is perfectly reasonable. One other difference is that military personnel who leave without retired pay are still young enough to plan and save for their own retirements. Relaxing the vesting rule makes it more difficult to keep competent personnel. If incompetent personnel are kept longer than needed, then the procedures for screening experienced people needs to be improved without tampering with the retention strategy.

While both OASI and military retirement have delayed vesting provisions, these provisions effect the systems differently. The vesting provision in OASI probably has little effect on labor force participation decisions. Its major effect is to screen out people who would qualify for small ben-

efits. Considering that there are alternative programs for the needy such as Supplemental Security Income, there is little welfare effect and probably some saving in administrative costs. In contrast the delayed vesting in the military retirement system plays an important role in labor force decisions.

3.2 Mandatory Retirement

Mandatory retirement is another feature of some retirement systems. Mandatory retirement means a worker is forced to retire. A mandatory retirement provision may be set in terms of age or years of service. Some retired pays have strong incentives for retirement at a particular time, but these incentives do not constitute mandatory retirement because the individual has a choice. In a mandatory retirement situation there is no individual choice. OASI does have retirement incentives but no mandatory retirement provision. Since 1947 there has been a mandatory retirement provision for military officers, but none for enlisted personnel. The mandatory retirement is a component of the up or out promotion system for officers. In general it requires officers who have been passed over for promotion, failure to select, twice to retire. This rule implies that an officer rank O-3 retires at 13 years, O-4 at 20 years, O-5 at 26 years and O-6 at 30 years. In addition, retirement is required at age 62 [12].

Mandatory retirement exists in the military but not in OASI because it is a tool of force management. There are two different explanations for mandatory retirement. Lazear [13] argues that by deferring a significant portion of compensation until the latter stages of a worker's career (or by offering lucrative pensions) an employer reduces the worker's incentive to shirk. As a result of the postponement the worker is paid a wage that exceeds his productivity value. Mandatory retirement allows firms to get rid of such workers, and the pensions serve as a tax efficient way to provide for delayed compensation. Lapp [14] argues that mandatory retirement is part of a contract that shifts part of the risk of uncertain productivity changes from the worker to the firm or in this case from the military personnel to the government. Both explanations view mandatory retirement provisions as part of an efficient contract. While efficiency is an important characteristic of a military retirement, it is not particularly a goal of social insurance.

Thus, its absence from OASI is not surprising.

The military mandatory retirement rules would, if they were in the private sector, violate the laws on mandatory retirement. The age discrimination act of 1979 bans mandatory retirement for most workers before age 70. The argument in favor of military mandatory retirement is the same as for the 20 year delayed eligibility. To the extent that imperfect information introduces inefficiency in private sector labor contracts mandatory retirement restrictions could improve the efficiency of these contracts. However, information about the terms and conditions of employment both in the present and in the future available to military personnel, particularly officers, is better than in most civilian occupations: mandatory retirement in the military is socially efficient.

4 Financing Methods

The method used to finance benefits influences the distribution of costs among the population. There are two aspects of a financing method to be determined. One, the program is either be contributory or non-contributory. In a contributory program current workers pay a portion of their current salary into a trust fund, and in a non-contributory plan no such payments are made. Two, the benefits are paid on a pay-as-you-go basis or from an actuarially sound trust fund. With a pay-as-you-go system current benefits are paid out of the current budget. With an actuarially sound trust fund the expected obligations from current employment are paid into a fund that is used to pay future benefits.

4.1 Funding Military Retirement

The military retirement system is a non-contributory system. This type of system is the most common form of pension funding in the United States. In 1977 only 12.7 percent of all contributions were made by employees 11. Employer contributions are generally preferable because their tax treatment is more advantageous than that of employee contributions. In a non-contributory system it is the employer, which in this case is the U.S. government, pays the entire cost.

An interesting question that arises when considering this aspect of the funding is whether workers actually pay for the pension contribution in the form of lower cash wages. Congress has never explicitly tied the level of military wages to the size of the retired pay, and so it has been argued that the existence of the retired pay has led to a reduction in military pay⁴. The reasoning goes as follows: military pay is set to be comparable to Federal Civil Service pay, civil servants do contribute to their pension plan, military personnel do not, therefore military wages are not lowered to reflect the value of retired pay. Given the noncompetitive nature of the military labor market this reasoning is plausible. However, it is questionable whether military pay is really comparable to civil service pay. For example, military and civil service pay raises are not the same each year. Also, any comparison of civilian and military jobs is likely to be full of imperfections. Military pay is determined by a number of factors including force requirements and labor market conditions. It is likely that if military personnel were required to contribute to the retirement system, in the long run salaries would be adjusted upward but by less than the amount of the contribution.

Until fiscal year 1985, the federal government used the current funding method rather than an accrual method for financing military retirement benefits. The cost of the military retirement system in 1983 was \$16. billion which represented 53 percent of basic pay expenses for that year. Starting in 1985, the government initiated a trust fund called the Department of Defense Military Retirement Fund which switched the funding of the system to an accrual basis. The budgetary cost of the trust fund in 1985 was \$8.9. billion which is about 51 percent of the expenditure for current retirees of about \$17.5 billion [14]. The switch to the accrual fund makes sense given that the function of the military retirement system is not an intergenerational transfer. The advantage of this accrual method is that currently incurred costs that will be paid in the future are acknowledge at the current time. It seems that this method will lead to a more rational choice system.

4.2 Funding OASI

OASI is, of course, part of the Social Security system and is funded through the payroll tax. OASI is a contributory system. Funds to pay benefits come from the contributions made by current employers and employees. These contributions are mandatory, where both the employer and employee pay the same percent of a worker's income up to a maximum earnings level. For example in 1983, the total tax was 13.4 percent of the first \$35,700 of earnings. The 13.4 percent is evenly divided between employee and employer contributions of 6.7 percent. Self-employed workers pay the total of 13.4 percent. One issue of interest in understanding the financing system is who actually pays the OASI tax. Economists have long argued that the burden or incidence of the payroll tax falls entirely on the employee. Policy recognition of this position has become evident by the change in the tax for the self-employed. Prior to the 1980's the sum of the employer and employee tax was greater than the self-employed tax. If the self-employed is considered primarily a worker, and the employer portion is really paid by the firm, then it made sense to have the self-employed rate be less than the sum of the employer plus employee rate. However, the change to equalize the two taxes seems to implicitly recognize that the full burden of the tax falls on the worker.

Although the OASI pension is contributory, the OASI trust fund is not fully funded, but rather a pay-as-you-go system. In a pay-as-you-go system the trust fund is not actuarially sound. There is not enough money in the fund to pay off all current or expected future liability. In 1982 the trust fund had \$19.3 billion as compared to annual benefit payments of \$156.0 billions. The fund only serves to smooth over the differences between current receipts and current outlays. Tax receipts for 1982 were \$148.0 billion., and so the \$8.0 billion deficit was paid for from the trust fund. In general current workers are paying taxes to fund the benefit payments to current recipients. The financing system serves redistribute income from the working young to the retired old generation.

5 The Timing of Changes

Whenever changes are proposed in either military retired pay or OASI, policymakers must also decide on the date that the changes become effective. For example, in 1980 the basis for determining final base pay for military retirees was changed from the last month of service to the average of the last 36 months, and in 1983 the OASI normal retirement age was raised from 65 to 67. Both of these changes had the effect of reducing the value of the benefit to the recipient. However, only some future recipients are affected by these changes because the effective date was delayed. These provisions which exempt current participants from changes are called grandfather clauses. Grandfather clauses are controversial.²² On the one hand, they are attractive to current recipients whose benefits are not cut. On the other hand, by not cutting current benefits, cuts in future benefits may have to be larger. This issue provides a timely example of how the framework developed in this paper can be used to analyze policies.

First, consider the use of grandfather clauses in military retirement. The military typically uses a complete grandfather clause, whereby no current or retired personnel are affected by a reduction in the retirement system. This delays the effective date for at least 20 years. The main reason for grandfather clauses is to avoid introducing additional uncertainty in the valuation of retired pay by active personnel. If changes in the system are frequently discussed or made, its value is undermined; becomes more heavily discounted and thereby less effective in deterring turnover. Thus, the grandfather clause is rationalized as a cost-saving measure.²³ But there are

²²Grandfathering is rarely, if ever, brought up as an issue when programs are being expanded, and yet there is no real difference between program expansions and contractions. If current recipients are exempt from cuts, why shouldn't they also be exempt when the program is expanded. This contradiction adds to the controversy of these provisions.

²³Another, perhaps more powerful, argument in favor of grandfather clauses has to do with equity. The equity argument is that it is unfair to change the employment contract once personnel enlist. While this argument is certainly reasonable, it should be pointed out that a number of factors that change after enlistment that could have an even more powerful impact on retirement pay than some changes in the retirement system that are grandfathered. For example, the size of pay raises in the last few years of service could have a bigger impact on the size of retirement pay than whether benefits are based on

other factors to consider. First, the grandfather clause itself is costly. How costly depends on the proposed change, but the cost of delaying implementation of retirement changes for 20 years is surely substantial. Having to make larger cuts in future benefits than would have been necessary without the clause may lead to higher turnover costs. Second, because of discounting the retirement system probably has little impact on retention of personnel in their first few years of service. Given that the goal of the pension is to influence retention, a complete grandfather clause can be inefficient. Partial grandfathering, in which changes do not become effective for 10 or 15 years, may be just as effective in retaining personnel, but less costly.

Now consider the grandfathering in the increase in the OASI normal retirement age. In this case, the grandfathering is only partial because the increase in the retirement age does affect some people working in the OASI system at the time of the change. A complete grandfather clause would delay the effective date of a program by 45-50 years, making the change an empty exercise. Even if the grandfathering is only partial, there is still the problem of determining the optimal amount. The tradeoff is between providing adequate information to plan retirement and providing equal treatment across cohorts. An unanticipated change in the retirement system can ruin someone's retirement plan. A person of 64 may plan to retire at 65 with the anticipation of living off his OASI benefits. If an increase in the retirement age were to be implemented without some grandfathering, the person could be left with neither a job nor an OASI pension for some period. Imposing such a hardship on an individual contradicts the intention of the OASI program. On the other hand, if the change is grandfathered, the the expected value of the pension differs by cohorts. A small change in the date of birth could have a big impact on the size of the pension. This too is unfair. In the case of the increase in the mandatory retirement age, the tradeoff is handled by phasing in the increase by 1 month per year over a period of 24 years starting in the year 2000. Phasing in the changes is a reasonable approach to the tradeoff, but there is still the problem of deciding when it should start and how quickly it should proceed.

the last month or the last 36 months of service.

6 Conclusions

In this paper I have shown that although both the (OASI) program of Social Security and the military retirement system provide substantial amounts of income for retirees, they are fundamentally different. In addition to providing retirement annuities, OASI attempts to improve the social welfare by redistributing income toward the old and the retired poor, (i.e., those with low earnings histories). The military retirement system helps manage military manpower. This system provides incentives for some personnel to remain in military service, and incentives for others to retire. Through this system the military is able to maintain an experienced force with sufficient youth and vigor to cope with the rigors and stresses of military life.

Policymakers need to be aware of the differences between in the programs because in a constantly evolving environment new problems and choices arise. As private saving provides increasing sources of income for the elderly, the relative importance of the redistributive function of OASI has increased. This change has implications for the structure of the program. The benefit formula could be made to have stronger redistributive features or tax structure could be made progressive. As military technology becomes more sophisticated the average amount of training increases. Experience becomes an important asset in maintaining an effective fighting force. The need to retain experienced personnel places a greater burden on the retirement system. In this environment changes must be made carefully. Cuts in military retirement do not necessarily translate into cuts in budget outlays. If fewer people remain in the military then more money is spent on training. The net effect may well be greater expenditures and a less effective fighting force. Any changes that are made should consider the tradeoffs retirement costs vs. effectiveness and training costs.

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